

CLAIMS:

1. A nickel-containing alloy comprising:
about 1.5 to about 4.5 weight percent aluminum;
about 1.5 to about 4.5 weight percent titanium;
up to about 3 weight percent niobium;
about 14 to about 28 weight percent chromium;
with the remainder being nickel.

2. The nickel-containing alloy of Claim 1, wherein the sum of the amount of aluminum and titanium is about 2 to about 9 weight percent, of the nickel-containing alloy.

3. The nickel-containing alloy of Claim 1, wherein the atomic ratio of aluminum to titanium is about 0.5 to about 1.5.

4. The nickel-containing alloy of Claim 1, wherein the sum of the titanium, aluminum and niobium is about 2 to about 12 weight percent, of the nickel-containing alloy.

5. The nickel-containing alloy of Claim 1, wherein the nickel is present in an amount of about 40 to about 70 weight percent, of the nickel-containing alloy.

6. The nickel-containing alloy of Claim 1, further comprising cobalt, carbon, zirconia, tungsten, boron, tantalum, hafnium, rhenium, ruthenium, molybdenum, or a combination comprising at least one of the foregoing.

7. The nickel-containing alloy of Claim 6, wherein the cobalt is present in an amount of about 10 to about 23 weight percent, of the nickel-containing alloy.

8. The nickel-containing alloy of Claim 6, wherein the carbon is present in an amount of about 0.02 to about 0.15 weight percent, of the nickel-containing alloy.

9. The nickel-containing alloy of Claim 6, wherein the tungsten is present in an amount of about 1 to about 3 weight percent, of the nickel-containing alloy.

10. The nickel-containing alloy of Claim 6, wherein the boron is present in an amount of about 0.001 to about 0.025 weight percent, of the nickel-containing alloy.

11. A nickel-containing alloy comprising:

about 1.6 to about 1.8 weight percent aluminum;

about 2.2 to about 2.4 weight percent titanium;

about 1.25 to 1.45 weight percent niobium;

about 22 to about 23 weight percent chromium;

about 18.5 to about 19.5 weight percent cobalt;

about 0.08 to about 0.12 weight percent carbon;

about 1.9 to about 2.1 weight percent tungsten;

and about 0.002 to about 0.006 weight percent boron;

up to 0.01 weight percent zirconium; with the remainder being nickel.

12. The nickel-containing alloy of Claim 11, wherein the zirconium may be substituted with hafnium.

13. A method for manufacturing an article comprising:

casting an alloy comprising about 1.5 to about 4.5 weight percent aluminum; about 1.5 to about 4.5 weight percent titanium; up to about 3 weight percent niobium; about 14 to about 28 weight percent chromium; about 10 to 23 weight percent cobalt; about 1 to about 3 weight percent of tungsten, rhenium, ruthenium, molybdenum, or a combination thereof; about 0.02 to about 0.15 weight percent of carbon; about 0.001 to about 0.025 weight percent of boron; up to 0.2 weight percent of zirconium, hafnium, or a combination thereof; into a mold; and

solidifying the casting.

14. The method of Claim 13, further comprising directionally solidifying the casting.

15. The method of Claim 13, wherein the casting is an equiaxed casting.

16. The method of Claim 13, further comprising heat treating the casting at a temperature of about 1095 to about 1200°C.

17. The method of Claim 16, wherein the heat treatment is conducted for a period of about 1 to about 4 hours.

18. The method of Claim 13, further comprising solution heat treating the casting at a temperature of about 750 to about 850°C.

19. A turbine component manufactured from the composition of Claim 1.

20. A turbine component manufactured from the composition of Claim 11.

21. A turbine component manufactured by the method of Claim 13.